

REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

New claims 13-16 are being added.

This amendment adds claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

After amending the claims as set forth above, claims 1-16 are now pending in this application.

Rejection under 35 U.S.C. § 112, second paragraph.

Claims 1-12 stand rejected under 35 U.S.C. § 112, second paragraph. In the rejection, the Examiner stated on page 2:

The scope of the recitation "a water trap disposed upstream of and close to the CO oxidation catalyst so dimensioned that absorption heat and condensation heat of water contribute to a rise in temperature of the CO oxidation catalyst" is indefinite in that, any condensation process would heat the exhaust gas stream.

Applicants respectfully traverse the rejection for the following reasons.

The aforementioned limitation in the claims is sufficiently clear and precise. The range where absorption and condensation heat is capable of contributing to a rise in temperature is limited because the exhaust gas after flowing out of the water trap is rapidly cooled by heat conduction to ambient air and by heat radiation. Thus, one skilled in the art would understand the limitation "a water trap disposed upstream of and close to the CO oxidation catalyst so dimensioned that absorption heat and condensation heat of water contribute to a rise in temperature of the CO oxidation catalyst" to mean that the water trap and the CO oxidation catalyst must stand sufficiently close to each other to fall in the range where absorption and condensation heat is capable of contributing to a rise in temperature.

Moreover, one skilled in the art could readily determine whether a water trap disposed upstream of a CO oxidation catalyst was so dimensioned that absorption heat and condensation heat of water contributed to a rise in temperature of the CO oxidation catalyst. For example, it would be expected that one skilled in the art would be familiar with heat transfer, and could calculate heat transfer and estimate the range where there is a contribution to a rise in temperature of the CO oxidation catalyst based on data such as flow rate, composition and temperature of the exhaust gas, condensation rate of water in the water trap, and dimensions of the water trap and the CO oxidation catalyst and physical properties of material related to these elements. Therefore one skilled in the art would be sufficiently apprised of the scope of the claims.

Further, the functional language "so dimensioned" is quite proper and clear as claim language. Specifically, as indicated in M.P.E.P. 2173.05 (b), in *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 806 F.2d 1565, 1 USPQ 2d 1081 (Fed. Cir. 1986), the court stated that the phrase "so dimensioned" is as accurate as the subject matter permits, noting that the patent law does not require that all possible lengths corresponding to the spaces in hundreds of different automobiles be listed in the patent, let alone that they be listed in the claims. Thus, the functional language "so dimensioned" in the claims is clear and definite.

In sum, the recitation in the claims of "a water trap disposed upstream of and close to the CO oxidation catalyst so dimensioned that absorption heat and condensation heat of water contribute to a rise in temperature of the CO oxidation catalyst" is clear and definite. Accordingly, applicants respectfully request that the rejection under 35 U.S.C. § 112, second paragraph be withdrawn.

Rejections under 35 U.S.C. §§ 102 and 103

Claims 1-9 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,776,417 to Frost et al. (hereafter "Frost"). Claims 10-12 stand rejected under 35 U.S.C. § 103 as being unpatentable over Frost in view of U.S. Patent No. 6,029,441 to

Mizuno et al. (hereafter “Mizuno”). Applicants respectfully traverse these rejections for at least the following reasons.

Independent claim 1 recites “a H₂O trap disposed upstream of and close to the CO oxidation catalyst so dimensioned that adsorption heat and condensation heat of H₂O contribute to a rise in temperature of the CO oxidation catalyst.” Frost is silent regarding an arrangement of a CO oxidation catalyst and a H₂O trap such that that adsorption heat and condensation heat of H₂O contribute to a rise in temperature of the CO oxidation catalyst.

Moreover, the arrangement as recited in claim 1 is based on the discovery by the inventors that the adsorption heat and the condensation heat of H₂O can be used as a heat source. Such an arrangement was not appreciated by Frost or other prior art. Thus, one skilled in the art would not have been lead to modify the Frost system to arrive at the system recited in claim 1.

The Office Action states on page 3 “With regard to the water trap contributing to a rise in temperature of the CO oxidation catalyst, this is an inherent function of the condensation process.” Applicants respectfully disagree. As discussed above, the range where absorption and condensation heat is capable of contributing to a rise in temperature is limited because the exhaust gas after flowing out of the water trap is rapidly cooled by heat conduction to ambient air and by heat radiation. Thus, it is not the case that the heat from the water trap inherently contributes to a rise in temperature of the CO oxidation catalyst. Applicants note that the rejection under 35 U.S.C. § 112, second paragraph, where the Office Action finds that the language in the claims is indefinite, is not a substitute for a proper rejection under 35 U.S.C. § 102/103. The language in claim 1 is definite, and is not disclosed by Frost.

Mizuno was cited for allegedly disclosing an HC trap upstream of a secondary air supply unit, and does not cure the deficiencies of Frost.

Claims 2, 11 and 12, respectively recite “an underfloor catalyst wherein a CO oxidation catalyst and a H₂O trap are coated on a support, so dimensioned that adsorption

heat and condensation heat of H₂O contribute to a rise in temperature of the CO oxidation catalyst”, “a H₂O trap disposed upstream of and close to the CO oxidation catalyst so dimensioned that adsorption heat and condensation heat of H₂O contribute to a rise in temperature of the CO oxidation catalyst” and “an underfloor catalyst wherein a low temperature light-off CO oxidation catalyst and a H₂O trap are coated on a support, so dimensioned that adsorption heat and condensation heat of H₂O contribute to a rise in temperature of the low temperature light-off CO oxidation catalyst.” (emphasis added).

Thus, claims 2, 11 and 12 are patentable for reasons analogous to claim 1.

The dependent claims are patentable for reasons analogous to their respective dependent claims, as well as for further patentable features recited therein. For example, new claim 13 recites “wherein the H₂O trap is disposed upstream of and close to the CO oxidation catalyst and so dimensioned that adsorption heat and condensation heat of H₂O contribute to a rise in temperature of the CO oxidation catalyst to attain an early activation of the CO oxidation catalyst.” Frost fails to realize the benefits of the arrangement of a CO oxidation catalyst and a H₂O trap as recited in claim 13, where the adsorption heat and condensation heat of H₂O contribute to a rise in temperature of the CO oxidation catalyst to attain an early activation of the CO oxidation catalyst. The arrangement of the H₂O trap and the CO oxidation catalyst as recited in claim 13 provides a relatively immediate rise in temperature of the CO oxidation catalyst just after an engine start, which leads to a quick light-off of the CO oxidation catalyst. Frost, failing to suggest the arrangement of a CO oxidation catalyst and a H₂O trap as recited in claim 13, also fails to realize the benefits resulting therefrom.

Analogous arguments apply to dependent claims 14-16.

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a

check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicants hereby petition for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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